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This Livestock Improvement Business*

By

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It is usual to discuss the subject of stock improvement under the headings of breeding, feeding and management, but the only distinct advantage in having these groups is that if anything goes wrong with one, one of the others can be blamed. All sorts of things can go wrong. It is for this reason that I chose rather a frivolous title for my address.

I am not proposing to go very deeply into any particular aspect, but want to review very briefly some of the considerations which I think are leading to a very changed attitude towards the whole question. These considerations make it obvious that what we want is a good deal more clear thinking, more honesty of policies and a more realistic approach to stock improvement generally, and on a wider basis. While the same principles apply in other animals, with cattle we are in a better position to discuss the topic, because we know a little bit more about the cattle industry. We have more opportunities for taking stock of the situation of the industry at the present time, especially in dairy cattle, which are particularly important in South Wales and therefore to the present meeting. Moreover, the South Wales cattle industry has some lessons which will apply equally well to the dairy cattle population of the country as a whole. For example, in South Wales great progress has been made in certain directions, *e.g.*, in attestation of herds; South Wales will become an exporting area for attested dairy cattle. Also, much progress has been made in recent years with another device which can be used to help improvement, namely, milk recording. It is interesting to note that in the last three seasons South Wales has practically trebled its number of recorded herds and practically trebled its number of recorded cows and first-calf heifers, but it has not quite trebled the full-year cows and has not even doubled the full-year first-calf heifers. Therefore, while the number of herds has been trebled, first-calf heifers have not even been doubled. Also, and this is a point which is perhaps significant to members, the percentage of full-year animals to total animals recorded has dropped during these three seasons: In 1943–44 full-year animals formed 63·9 per cent. of total animals recorded, in 1944–45 they dropped to 60·9 per cent., and in 1945–46 they were down further to 57·8 per cent. of the total animals recorded. There are various reasons for this—perhaps disease, or greater turnover of dairy stock—but it indicates one of the snags to dairy cattle improvement.

The time has come when we must be quite honest about the snags. In the first place, there is the very high wastage rate which occurs in the dairy herd. This may be due to disease, accident, sterility or low production. Whatever its causes, it is unduly high. As long as we have this, not much progress can be made. It slows down the rate at which we can make selection, and we have reached a point where it is impossible on the average to make any better selection for breeding stock amongst dairy cows at all. The average life of a dairy cow is 3½ lactations. This means that the average cow drops no more than two bull calves and two heifer calves. Therefore, every heifer calf that is born has got to be kept in order to make a replacement for an existing cow.

Also, high wastage has another depressing effect on national milk production—so long as the average producing age of the cow is 3½ lactations, the average cow in the country never reaches maximum milk production. If the average age could be raised, we would have a higher rate of production, simply because more of the cows in the national herd would be older and nearer their maximum yields.

This leads me to one or two points regarding milk production—we must face up to the fact that the average milk production in this country is just shockingly low. It is less than 500 to 550 gallons and could certainly be increased by better feeding and better management. But even if we did increase that average production in this way by 100 gallons, we would not have made any long-term contribution towards the improvement of our breeding stock. Higher standards of feeding and management would still leave in the national herd a high proportion of the poorer cows, but there is little doubt that as a first step towards higher production, attention to these aspects would yield spectacular results.

I would suggest that members present, who are continually moving about amongst cattle breeders, could do a great deal to persuade cowkeepers into a better attitude towards management. For example, at a meeting of a local milk recording association a few weeks ago, the good herds were first quoted, and then the not-so-good herds, and the differences were pointed out and attributed to differences in management. Of course other explanations might be given by the farmers concerned. It is only a relative matter—management is given as the explanation of good yields, but bad management is never confessed as the reason for low yields.

This low milk production as a whole—500 to 550 gallons—applies to the national average. Of the milk recorded herds in England and Wales, the average last year was 7,132 lb.; this was a sample of 18·2 per cent. of all cows. For South Wales, the average for all cows was 622 gallons, covering only 13·7 per cent. of all cows. Not only did the selected sample of recorded cows produce less on the average, but also it was a smaller sample; these two things need careful watching together. With regard to the Shorthorn breed—the common type of cow, especially in South Wales—if we take the two sets of figures, the average yield of the Shorthorn cow for the whole country comes to 659 (say 660) gallons, while in South Wales it is only 590 gallons.

We are here faced with the problem as to whether farming conditions in South Wales differ from the rest of the country. But, even if we do allow for a greater variety of farming conditions, then these figures show that we have far too many poor cows producing milk, far too many cows which are not pulling their weight, far too many passengers. Of the recorded Shorthorns throughout England and Wales, 23 per cent. of them in 1945–46 produced less than 500 gallons. The same picture presents itself where butter-fat is concerned. In South Wales nearly one-quarter of them (23·6 per cent.) were producing less than 3·5 per cent. of butter-fat; in England and Wales, 39·5 per cent. of recorded cows produced less than 3·5 per cent. of butter-fat.

I have not quoted these figures in any spirit of criticism, but have merely mentioned them in a spirit of taking stock of just where we are, and to show that, whichever way we look at it, we are up against the problem of "passenger" cows. The main problem in all questions of livestock improvement is to get rid of the large dead-load of inefficient animals. It is fairly clear that, in general terms, one of the big factors of the output per man is the output per cow, and in the future we are going to have no room at all in the industry for the inefficient cows. I suggested not so long ago that before ten years were out, there would be no place in a milk-producing herd for any cow that produced less than 600 gallons, and many dairy farmers agreed. We are not alone with this problem; a recent estimate in the U.S. showed that one-third of all heifer calves born were doomed to be duds—if this is true, then the outlook is pretty serious.

We can set up for ourselves a reasonable yardstick, against which we can measure the efficacy of any method of improvement, whether by feeding, management or breeding. All methods can be judged according to whether they get rid of the passenger cow, or whether they prevent her being born. According to this yardstick, we can distinguish between the purely negative methods (that is, getting rid of the inefficient cows), and the positive efforts (preventing the passenger cow being born). So far there are four main methods which have been used, and their effects are mainly negative.

1. Mass selection—phenotypic selection—selection on appearance. Here no progress at all has been made; there are still many poor producers. It seems that the average yield is no better than it was 50 years ago. One form of this selection is found in the Bull Licensing Act; the Act itself is not only badly worded, but has also done nothing more than put on a formalized basis what had been happening for years, *viz.*, culling, which had been negative over all generations.

2. Selection on the basis of external indicator characters: the fact must be accepted that there is no definite external indicator which will tell you whether the animal will produce highly or not.

3. Show type: here we have to accept such evidence as there is—that show type in itself has not had any positive effect, has not led in itself to any increased performance. What we are up against

*Address by Professor Nichols to the meeting of the South Wales Division, N.V.M.A., held at Aberystwyth on June 6th, 1947.

more than anything else is the question of management for the show type rather than management for performance.

4. Selection according to pedigree: pedigree alone (on the basis that the parents were registered) has had little effect in aiding or selecting for increased performance. It is interesting in this connection also to note that:—

(*a*) amongst pedigree stock at the present time there is a very great variability of performance; and

(*b*) the pedigreed cattle of this country amount to only 3 or 5 per cent. of the cattle population.

During the last 40 to 50 years there has been a strong contention that the best way to increase performance and productivity of stocks is to use pedigree animals. It is stretching a point to assume that all the good attributes of necessity reside in that 3 per cent. of the total population, especially when we consider that a great number of non-pedigree stocks at the present time have been using pedigree bulls for generations. The pedigree system as it stands is an isolating mechanism—it keeps a favoured bunch of stock out of the common herd.

Arising from that idea, there is the question of how we stand with regard to that other policy—"grading up"—officially recognized as a process of grading up to pedigree stock from non-pedigree foundations. If we think of it in terms of increased efficiency of production, in itself it hardly takes us anywhere at all, unless it is carefully and consistently carried out. Here I should like to quote a few figures, which are admittedly not conclusive but may be of interest.

The Milk Marketing Board, in their Annual Report each year, publish lists of the highest yielding cows in England and Wales for the different breeds. They work out to about 0·2 per cent. of the total animals.

Ayrshire. Out of the 66 listed animals (1945–46), 24 were non-pedigree.

Friesian. Out of the top 151, 109 were pedigree, 21 non-pedigree, and 21 grading up.

Red Poll. Only eleven animals listed, and out of these six were non-pedigree.

Shorthorn. Divided into two groups: (1) those with lactations of 315 days or less, and (2) those with lactations of 315 to 365 days.

(1) Short lactation Shorthorn: of the leading 30, 19 of them were pedigree, and the remainder non-pedigree or grading up. Out of the total 62, 35 were pedigree and 27 non-pedigree.

(2) Long lactation Shorthorn: 149 animals were listed; of these 106 were non-pedigree, 18 grading up, and 25 pedigree.

On general evidence we can say quite fairly that such breeding policies have been placing the emphasis in the wrong place. They tend to slow down progress. It is worth while considering whether or not the fact that we have made so little progress in efficiency of milk production recently may not be due to the fact that these processes have been receiving very much greater propaganda than ever before.

To turn to the males—we have got to face up to the fact that at present we have a very rapid turn-over of bulls in our cattle population. (The same also applies in rams.) If we take the bull, we find that there are about 106,000 bulls in use in England and Wales in any one year; also that the annual intake of bulls into the breeding herd, as judged by licensing figures, is about 36,000. That is, every year it is necessary to license about one-third of the total number of bulls in use. There is too short a period for ordinary purposes to get any idea of what the offspring of the average bull will be like. The high intake is undesirable, especially when we have a rapid turn-over of cows and also, a rapid turn-over of breeders. In practically all kinds of livestock, the average breeder does not own a herd for long enough to make any definite impression on it. There is always bound to be a lack of consistent breeding policy throughout the breed as a whole, when the breeder is prevented, for some reason or other, from putting his policy into effect for anything more than two or three cattle generations on the average.

The need for more positive steps must be emphasized—steps which aim at preventing the poor cow from being born. First, there can be no doubt that before we can make positive steps operative, we want a great deal more information, more real records. What we really need is to be able to make much more accurate discrimination between those animals we want to be parents and those we do not wish to be parents. The main contributions here are: (1) more performance tests, and (2) more use of the progeny test. The main point about the progeny test (and the one most neglected) is that it must apply to *unselected* offspring. Because this is not done, the tests so far made are not worth the attention they receive. Some of these positive steps are already being put into practice, especially those of combining performance testing with pedigree, to give what are known as "performance pedigrees."

One direction in which these positive steps could be directly applied is through the premium bull scheme of the Ministry of Agriculture. For example, at a recent sale in this country 15 bulls received approval as premium bulls. Of those 15, ten of them had no worthwhile information with regard to their sires; 12 dams had no butter-fat records; only two sires were mentioned as having had any other offspring; in the case of one only was it stated that the sire had two sisters that were 1,000-gallon cows. In effect, therefore, there was no information as to performance in the pedigrees. As it stands it is a potentially positive step having an almost negative result.

Another direction in which positive steps are being applied is in the development of artificial insemination. Two things are involved: (1) a better bull can be used over a much wider range of cows, and, because of this, (2) more precise selection can be paid to the bull going to be used at the artificial insemination centre. This is the only positive step which is being directly applied on any worthwhile scale in this country at the present time.

Yet mildly positive steps are being applied indirectly; in, for example, greater price distinction between bulls *with* performance pedigrees and those *without* performance pedigrees at the bull sales. It is difficult to get figures out, but you can certainly say that the tendency in recent years at pedigree sales had been to place a heavy price distinction on animals which have a reasonable butter-fat ancestry, and in the case of the Shorthorn, for instance, emphasis is being placed on short pedigree animals rather than on long pedigree animals, unless the latter have a reasonable performance pedigree as well as a fashionable name.

What is going to happen in the future? How are we going to get positive steps more widely adopted? Clearly we must all pull together, and among desirable measures I suggest:—

(1) A much greater application throughout the whole cattle population of this principle of more precise selection; and allied with this, a clearer-cut aim in our breeding policy, and also a much simpler policy, not one tangled up and distracted by minor considerations.

(2) A very much more realistic effort towards accurate selective registration on the part of the breed societies.

(3) More co-operation between breeders in the different breeds.

Following from these, there will probably be, in the future, a reorganization of the breeding industry—a change of attitude and methods within the various breeds. It seems fairly clear that we are likely to meet before very long some sort of division of enterprise within the breeds themselves. There will be specialized bull breeders within each breed—people who set out deliberately to breed the sort of bulls that the breed wants. At the present time there are far too many people breeding bulls; the better breeders do not put all their good bulls into circulation. The better breeders tend to cull, veal or castrate too many good animals, while the breeders with inferior stock tend to keep too many bulls to bring forward for licensing; and many of these animals are licensed, to meet the high turnover in bulls already mentioned.

We must have in the future a very much more objective propaganda, and a lot less quackery from those no doubt high-principled but misguided people who tend, through ignorance or myopia, to over-simplify the situation. We have got to rely on a greater appreciation of the sound principles of livestock production in all its aspects than we have had in the past. It is in this respect that members present are going to have a very profound effect throughout the country. In their contacts they are well placed to aid in carrying through this better educational campaign, which I think is much more needed in this country than perhaps anything else at the present time.

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Discussion

Mr. K. O'Sullivan: One and a half years' experience at the Cheswardine A.I Centre had led him to regard the whole question of cattle improvement from a wide practical aspect. Broadly speaking, there were two groups of farmers, one which set out to select a suitable type of animal and to improve it, the other which just used bulls in order to get their cows in calf. The latter were more common. So far as aiming at improvement was concerned, it was clear that more records were necessary, but in relation to the use of records, farmers again fell into two categories:—

(1) Those who were fully aware of the value of milk records and the need to record; these breeders tried to take into account all possible factors affecting their production and judged their stock by output; they took account of the results of butter-fat testing and made full use of the possibility to cull low yielders. There were not nearly enough breeders in this category and for this purpose of improvement it could be said that recording was in a deplorable state.

(2) Bull breeders who have got to record in order to sell their bulls. At the present time these are the main people recording.

There was no doubt that improvement was necessary all along the line. Good care of the cow and of the calf should be emphasized, especially starting with the calf, because the calf of to-day is the cow of to-morrow. It was essential that the calf should obtain a good start in life and that breeders should resist the temptation to starve the calves and sell milk. More attention was necessary towards the better rearing of heifers. A forward step had been taken in that it was now common to inoculate heifers against contagious abortion. It should not be necessary to leave heifers as late as two and a half years of age before being mated, but some such animals were noticed in A.I. work.

It was most important that very careful selection should be given to the choice of bull. The whole idea of artificial insemination is based on this careful selection, but it was proving difficult to exercise a sufficiently careful selection, because recording had not yet gone far enough to provide satisfactory information about a sufficiently large number of bulls from which the final choice could be made. However, bulls were now being chosen primarily on performance for the A.I.

centres. In his view, it was certainly necessary to take conformation into account in order that the breed standard might be maintained. On the average about two out of every three bulls fail on the various tests for artificial insemination. He agreed that many good bulls were slaughtered at three to four years old, *i.e.*, too early for proper assessment.

With regard to the use of artificial insemination, it was found that all sorts of farmers were taking part in the service. It was being used by some pedigree breeders, by large commercial farmers, and also by small farmers. The greatest benefit came to the last group.

Artificial insemination was one of the quickest ways to improve the standard of milk production, but was not everything in itself. The present high wastage must be reduced. Under the present circumstances, very few cows reached their maximum production of the fifth lactation. In his opinion consistency and longevity of production rather than single high yields was wanted. The cow should milk well for 45 weeks. He considered that it was possible to increase the present average up to 800 gallons, and in fact he would suggest that producers should aim at a 1,000 gallon target. With regard to using improved methods of husbandry, farmers tended to be conservative and few fed according to yield, although this should give them one of the greatest advantages from milk recording. He was aware that there was a lot of discussion about conformation and pedigree *versus* production. The fact was that definitely performance could not be foretold from appearance.

Mr. L. E. Hughes: The important question was that of how much correlation existed between the breeders and the people who were attempting to help improvement. The veterinary surgeon, for example, was often placed in an invidious position when he was asked to examine a bull which had been licensed by the livestock officers and yet which showed some defect and was therefore unsatisfactory in the view of the veterinary surgeon. He asked specific questions relating to the degree of correlation that could be expected between the milk production of dams and their progeny in an average herd; also what improvement could be expected from better feeding and management on the one hand, and by a better and more definite breeding policy on the other. Difficulties might easily arise in practice when a proven bull might contract trichomoniasis—what method was used in connection with Artificial Insemination centres for testing for trichomoniasis?

Professor J. E. Nichols: There was a general tendency for offspring to regress towards the breed average, which under certain circumstances could be interpreted, in a particular herd, for daughters of outstanding dams to be not so good as those dams, and for daughters of poor cows to be better than their dams. As to the progress that might be made from a breeding policy, account had to be taken of the principle of "reach and gain," that is, one had to think in terms of the heritability of the characters. With heritability of milk yield only somewhere around 20 per cent., this meant that on the average only 20 per cent. of a hoped-for difference between parents and offspring could be gained through the action of genetic factors. At a low average level of production a gain in this way might be very small compared to that to be made from better feeding and management, and he considered that, as a first step in a practical policy, the average production could be raised quicker and more readily by improvement in environment.

Mr. K. O'Sullivan: Examination of bulls for A.I. centres was made by the Ministry's veterinary officers, who used sheath washings in testing for trichomoniasis.

Mr. D. G. E. Davies (Llandyssul) referred to the question of the correlation between conformation and performance. Were there any definite data to establish the correlation between the character of the milk veins, their diameter and size, in relation to milk yield? Also, to what extent was butter-fat content affected by feeding?

Professor Nichols: A number of investigations had been made on the question of the relationship of conformation and performance. A classical study by Gowen, for example, showed that no external feature gave so good an indication of production as even a seven-day record during the lactation. Other studies considered the production of prize winning cattle inspected for type classification schemes. While animals ranking highest in type tended to be good performers and those low in type classification to be inferior performers, this was only a very broad association. There was still sufficient room for an animal of good type to be a low producer and one of poor type to be a high producer, to say quite definitely that there was no definite correlation.

On the question of butter-fat, while claims had been made for the effect of some specific foodstuffs, for practical purposes it was safer to assume that variations in butter-fat content followed inversely variations in milk yield. Butter-fat content was, however, inherited independently and therefore had to be considered as a separate genetic problem.

Mr. F. V. John: How much of the high wastage rate was due to nutritional deficiencies? He referred to the existence of large numbers of anoestrous first-calf heifers which went into the cow-heifer beef grade. If feeding conditions were improved, would the wastage rate diminish? In his view, West Wales was heavily overstocked, so that the cattle did not get enough food to produce properly. He felt that with fewer stock there would be higher production. With regard to the Bull Licensing Act, in his view it had done more harm than good, as too much attention was paid to judgment by eye and condition. The bulls were turned down on such factors as colour. For improving the standard of dairy stock such methods were useless. He asked whether it would be better if the whole system of showing dairy animals were done away with, since type and production were so far removed from each other. In any case it was generally recognized that the high yielding cows were not shown. Did milk inheritance follow Mendelian lines or "Dilution"? Also, he wondered whether progeny testing, as ordinarily carried out in this country, went far enough to be of much help.

Professor Nichols: The question of progeny testing had been broadly covered in the paper, but it could be added that our usual Register of Merit schemes, so long as they depended on a selected group of daughters, had little practical significance beyond giving a slight indication of the possibility of superior worth.

Accurate scientific information was certainly required on the question of how far nutritional deficiencies did affect the wastage rate. Reports from various centres seemed to indicate an increasing number of cases of infertility in young stock and an increase in heifers going into the cow-heifer classes. In his view it would not be safe to attribute infertility to specific deficiencies. The whole question of feeding level in relation to growth and development was of great importance. This bore upon the question of overstocking. The fact that many dairy cows were low producers had been stressed, and it seemed clear that the same amount of milk, if not more, could be obtained from fewer cows provided that those cows were of better genotype or potentiality for production and were properly fed and managed. Useful production by a young cow especially seemed to depend largely upon the way in which she had made growth towards maturity. Many farmers were expecting too much from badly reared and grown heifers when they were served early and had still to make a good deal of their growth while carrying a calf, and still more when they were expected to yield milk and yet go on growing. It might be that an important reason for the low average production was the high proportion of first lactation cows which had not been reared sufficiently well to allow them to put up a good performance in their first lactations. This was not, however, an argument for forcing young stock too far.

The question of show type raised some practical difficulties for breeders of pedigree stock, in that financial advantages came from conforming to show standards. This very fact, however, conferred additional disadvantages on selection, in that, if show type and points were not definitely correlated with performance characters, then they merely gave the breeder more points for attention in selection, and therefore slowed down or even reversed progress towards performance. The number of genes involved in the inheritance of milk yield was not known. It was a complex situation, in which the action and interaction of many genes was no doubt involved. Milk yield as a whole did not behave in a simple Mendelian manner, although each of the constituent genes might behave simply in itself.

Mr. D. E. Davies (Llanbyther): A breeder might have to choose between an old proven bull and a young bull which appeared to be as good on paper. Which was the better? What were the speaker's views on the question of dual-purpose stock *versus* single-purpose? With reference to sheep, was there definite evidence that fertility was inherited? He referred to the old practice amongst Welsh hill sheep breeders of leaving undocked the single lambs, so that they could be identified later. On the question of growing calves, it was his view and experience that autumn-born calves did better than spring-born ones. Was there any clear evidence on this point?

Professor Nichols: On the question of the choice between the old proven bull and the young bull, each case would have to be taken on its merits. On general grounds and amongst larger farm stock, the progeny test was a better indication of breeding merit than any other. In this sense, the proven sire would be the better choice. However, with an increasing development of performance testing, enabling proper and reasonable performance pedigrees to become available, selection of young bulls on the strength of their performance pedigrees would become more certain. In this direction some American breed societies were able to allocate special identification to young bulls at birth, according to the standard of their performance pedigrees. Depending upon the performance pedigree, increased accuracy of distinguishing between the potentially good bull and the inferior bull was possible.

The dual-purpose question was of course a difficult one and had many facets. For example, it could be stated that the degree to which different performances might be required in a single animal depended on the general stage of development of the cattle industry in a particular country. Under certain conditions a degree of dual-purpose performance might be an economic and practically desirable aim. On the other hand, under different conditions, when for instance milk production was a desirable and economic aim in itself, then the stronger arguments were in favour of single purpose milk producers. There was also the difficulty of definition, in that genetically a strain or breed in which high milk production and high butter-fat content were combined, represented a dual-purpose type. However, on the usual connotation of combination of beef characters and milk production, there was a general physiological conflict in the full expression of both sets of characters. This did not mean that of necessity high performance in both products would not or could not occur in some animals. It was a question of breeding aim, and the simplest, most direct and therefore most efficient method of working towards that aim.

With regard to sheep, there was good evidence to show that fertility was inherited, although of course it was well known that the fertility expressed could be greatly affected by nutritional conditions. With regard to the difference between autumn-born and spring-born calves, data had been published which tended to show that the autumn-calved animal did make better growth and development. However, in his view the available data did not cover the many different factors of feeding, management and genetic considerations involved. A good deal more study was necessary on this point. He considered that this was a case in which the apparently simple explanation might not always be the soundest.

Mr. E. T. Rees-Evans: Was there any evidence that "peas" in the teat were inherited?

Professor Nichols replied that he could not recollect any evidence on this point, and suggested that the speaker should approach the Imperial Bureau of Animal Breeding at Edinburgh, as that Bureau had catalogued all available references to the inheritance of defects and abnormalities in larger farm stock.

BIOLOGICAL STANDARDIZATION

B.C.G. Vaccine

A number of subjects connected with the standardization of biological products were discussed at the last meeting of the expert committee of the Interim Commission, World Health Organization, reports the *Pharmaceutical Journal*. On the subject of B.C.G. vaccine the committee agreed that it was at present impracticable to set up a standard for B.C.G. vaccine, but, in order to meet the urgent need for uniformity of the B.C.G. vaccines in current use the committee recommended that: (*a*) The original strain of B.C.G. kept at the Pasteur Institute, Paris, should be made internationally available; (*b*) The State Serum Institute, Copenhagen, which already distributes on behalf of the committee a number of the international preparations, should also distribute the B.C.G. strain; (*c*) The preparation and the use of the vaccine in each country should be centrally co-ordinated.

Vitamins

It was considered that the following problems in the domain of vitamins were the most urgent: (*a*) The replacement of the present international standard for vitamin A which is a preparation of β-carotene, by a standard consisting of a vitamin A ester. The existing international preparation of β-carotene should then be established as an international standard for β-carotene for agricultural purposes. (*b*) The replacement of the existing international standards for vitamin D, respectively, preparation of calciferol (vitamin D_2) and irradiated ergosterol, by an international standard consisting of vitamin D_3.

The experts proposed the creation of an expert sub-committee on the fat-soluble vitamins to study these two subjects and report on them, the members of the sub-committee to include experts already at work on these problems. They also discussed the vitamins not yet standardized and considered that they were either sufficiently well characterized by physical and chemical means, or at this stage so ill-defined in their biological action as to preclude any attempt at standardization.

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It is reported that the lives of 2,000 animals were saved during last winter by two R.S.P.C.A. inspectors, who spent nearly a month on Dartmoor providing food and bedding for sheep and ponies.

Immunity to East Coast Fever

By

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East Coast fever is peculiar among protozoan diseases in that recovery from natural infection results in a true immunity. Its duration, however, in the absence of re-exposure to infected ticks, is still the subject of some speculation, and it seems to the writer that standard text-books are not sufficiently clear on this point. Thus Hutyra & Marek (1938) state that recovery is followed by permanent, sterile immunity which cannot be broken down either by fresh infection or unfavourable conditions, Wenyon (1926) that animals "may recover naturally and possess an absolute immunity to further infection," Gaiger & Davies (1946) that "recovered animals are solidly immune and never show any relapse," Culbertson (1941) that "cattle which recover from a first infection are thereafter completely resistant to infection," whilst Bevan (1934) does not discuss the possibility of breakdowns.

Opinions expressed in scientific articles show more variation. Thus Richardson (1930) considers that immunity is solid and permanent and Du Toit (1931a) writes that immunity to East Coast fever is "solid and sterile," but later Du Toit (1931b) qualifies this remark by stating that the fact that immunity can be broken down in a small percentage of cases when animals which have recovered from the disease are re-exposed to infection is "well known." Du Toit goes on to describe various experiments which show that it seems impossible to break down an animal's immunity by artificial means and that relapses, in the sense in which they occur in human malaria and bovine anaplasmosis, do not take place. Theiler (1917), in a paper read at the Witwatersrand Agricultural Show, remarked that cases of salted oxen breaking down to East Coast fever when placed on badly infected transport roads had been observed and quoted one particular case in detail. Purvis (1937) believes that immunity to East Coast fever depends on constant re-exposure to infected ticks and that its duration in young animals is a matter of a few weeks only in the absence of reinfection. Walker (1925, 1926), on the other hand, describes an experiment wherein ten adult cattle, which had recovered from natural infection, were subsequently re-exposed after living under tick-free conditions for considerable periods. Only one showed a reaction and it recovered. Daubney (1932) carried out a similar trial with eight adult animals and found that none died on re-exposure, although three showed mild reactions, Koch's bodies being absent in smears.

In both Kenya (1934) and Uganda (1933) a peculiar condition known as "turning sickness" in adult cattle from enzootic areas has been observed, characterized by nervous symptoms. When death occurs, the *post-mortem* examination reveals the presence of Koch's blue bodies in the brain and spinal cord only. It might seem surprising that "turning sickness" appears to be confined to cattle living in enzootic areas and which should, therefore, be thoroughly immune, for no cases have been reported in animals which have enjoyed complete freedom from East Coast fever for any length of time. But it should be remembered that in Kenya at least "turning sickness" has always occurred in heavily infected, East Coast fever quarantine camps, amongst animals brought in from areas only lightly populated by infected ticks. Most of these animals show no reaction, but a small proportion exhibit a cerebral form of East Coast fever.

It is clear that there is considerable evidence in support of the contention that lasting immunity to East Coast fever depends on some degree of exposure to natural infection and that in the complete absence of this condition for long periods, breakdowns will, and do, occur. But it is equally clear that immunity is more durable than some workers believe, since, in clean areas in this colony, there are work oxen, branded as being immune to East Coast fever, which have lived for considerable periods without coming into contact with infected ticks, and have then moved into infected areas without suffering any observable ill effects. The fact that such animals carry a "guarantee," in virtue of their brand, ensures that in the event of an apparent breakdown, their owners would inform the veterinary department of this fact with celerity. In fact, such cases are very rarely reported.

Whatever may be the true nature of immunity to East Coast fever, there is general agreement that apart from the peculiar condition known as "turning sickness" animals in enzootic areas gain a solid and durable immunity. It may be of interest, therefore, to record a genuine case of complete breakdown under conditions which, it would have been thought, should have precluded such an event. Moreover, it is only rarely that such instances occur under natural conditions and in circumstances which permit an accurate representation of the facts.

In September, 1944, a farmer in an enzootic East Coast fever area purchased a one-month-old, grade, Ayrshire bull-calf. Shortly afterwards the calf became ill and was seen by a colleague who recognized all the usual clinical symptoms of East Coast fever. Slides were taken on September 18th and revealed numerous small piroplasms and Koch's blue bodies. The animal recovered. Two years later, in August, 1946, the writer received blood and gland smears from the same animal. The small piroplasms of *Theileria parva* were found without difficulty in the blood smear, whilst the gland smear showed the presence of numerous Koch's blue bodies. Unaware of the identity of the animal, the writer reported East Coast fever. The following day the owner rang up the laboratory and challenged the diagnosis, stating that the animal had recovered from East Coast fever in early life and was immune. The animal was then examined and found to have a high temperature and swollen glands. Further smears were made and the diagnosis of East Coast fever reaffirmed. Death occurred on August 7th, eight days after illness had first been noticed by the owner. An immediate *post-mortem* examination was made.

It has been the writer's duty to carry out *post-mortem* examinations on innumerable cases of East Coast fever and it is no exaggeration to say that classical lesions of the disease are absent in a surprisingly high proportion. This particular case, however, was remarkable in that every classical lesion mentioned in text-books seemed to be present. There were characteristic, shallow, black, angular ulcers in the abomasum; white, pin-head-sized infarcts in the kidneys; oedema and emphysema of the lungs with lobular hepatization; abundant yellow froth in the bronchi and trachea; haemorrhages in the epicardium and endocardium; exudations of serous fluid in the chest cavity and enlarged, oedematous, haemorrhagic glands. In addition, there was a marked yellowing of the tissues, whilst the urine was port-wine coloured, but these changes were due to a breakdown to redwater and anaplasmosis. Spleen slides showed the presence of numerous Koch's blue bodies and small piroplasms, *Babesia bigemina* and *Anaplasma marginale*.

The main point of interest which emerges from this case is the fact that the breakdown to immunity occurred in an animal subjected to enzootic conditions at a month old and maintained in these circumstances for two years. No great fluctuations took place in the number of stock or in the ratio between young and old animals. The farm is not fenced. The identity of the animal was proved beyond all doubt since it was the only grade animal on the farm, the remainder being a native breed. This particular animal must, therefore, have been in constant contact with infected ticks from the time when it arrived on the farm until its death. Whether the solidity of immunity to East Coast fever is, or is not, dependent upon re-exposure, it is indeed surprising to meet a case of breakdown in immunity in an animal maintained for two years under the conditions just described.

Acknowledgments.—I wish to express my thanks to the Director of Veterinary Services for permission to publish this article.

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Reference to milk adulteration is made in a report of the Lancashire County Analyst, Dr. G. H. Walker, who states that the percentage of adulterated samples was 10·2. There had been little change in this figure for five years, but the seriousness lay in the fact that it was double that of pre-war years.

* * * * *

Breeding experiments with pigs are now being carried out at Harper Adams Agricultural College, where the experimental pig department has been reopened after closing down during the war.

Blood Transfusion in Dogs

R. E. WILLIAMS, B.V.SC., M.R.C.V.S.
SOUTHAMPTON

The transfusion of whole blood or plasma has not achieved the popularity it deserves in the clinical armamentarium of the veterinary practitioner in this country, in spite of the emphasis which war-time medical practice has laid on the indisputable benefits of prompt transfusion in a large number of conditions which regularly confront the small-animal practitioner.

The superiority of whole blood in comparison to saline or other infusions is evident in cases of haemorrhage, shock, pre- or post-operative debility and toxaemia. It may also be usefully employed to increase blood coagulability, stimulate haemotopoiesis, and possibly confer immunological factors to the recipient.

Why, then, has the development of this form of therapy suffered so much neglect? The practitioner's answer usually emphasizes three very real difficulties—lack of equipment, lack of skilled assistance and, above all, lack of time.

The following account of a technique is offered in the belief that it is eminently practicable under "field" conditions, and that it may help those who have hitherto found the snags discouraging, or too time-consuming.

Collection of Blood

The most suitable donor is a healthy young mongrel of terrier size and, wherever possible, 12 hours' fasting should precede collection to reduce the lipoid content of the blood.

The apparatus required consists of (1) a sterilized Vena Flask (B.D.H.) containing 60 c.c. sterile solution of 3·8 per cent. sod. citrate; (2) a Higginson's rubber enema syringe; (3) a length of rubber tubing, carrying a glass window, of suitable gauge to connect with the needle which may conveniently be of the size usually employed for hypodermic injections in cattle.

Twenty c.c. of the citrate solution is run into the tubing and needle to prevent clotting at these sites, leaving 40 c.c. in the flask. This is sufficient for the collection of 400 c.c. of blood, which generally will be adequate for most purposes.

The apparatus is connected up as illustrated, and negative pressure can be developed in the flask by use of the enema syringe in reverse.

Fig. 1.—Collection of Blood under Nembutal Anaesthesia.

Light nembutal anaesthesia is induced in the donor, which is then fixed in dorsal recumbency with head and neck fully extended. The jugular area of one side is shaved and sterilized. The jugular vein is easily raised by digital pressure and the needle inserted. This is best carried out in two stages. The flow of blood is quite free if the needle is correctly inserted, and may be increased or maintained by regulating the negative pressure in the flask.

When the desired amount of blood has been collected the flask is disconnected and sealed with its special caps, and the contents mixed with a gentle rotary movement.

The time required for collection of 400 c.c. of blood need be no more than 15 minutes from the administration of the anaesthetic to the sealing of the flask, and once the technique is familiar and established pentothal or intraval sodium will be found to provide anaesthesia of adequate duration.

Absolute cleanliness is essential to success and any attempt to clear obstruction due to clotting is a complete waste of time. If this occurs a fresh start should be made with a duplicate set of tubing and needle prepared in advance.

Storage of Blood

After collection, any blood which is not to be used at once should be dated and stored as soon as possible at 4° C. in an ordinary domestic refrigerator. Agitation during storage must be avoided.

The blood rapidly settles into its constituent layers: red corpuscles at the bottom, a thin layer of leucocytes, and finally the plasma which should be lemon yellow in colour and fairly clear. Lipoids if present in quantity will cause cloudiness of the plasma layer.

Haemolysis of the red corpuscles generally commences after four days, and free haemoglobin diffuses through the plasma layer which becomes amber coloured.

A bottle of blood which shows general turbidity, indicating contamination, should be discarded.

Blood removed from the refrigerator must be used within 12 hours or discarded.

For use, the blood must be warmed to the normal temperature of the recipient and mixed by gently inverting the bottle twice.

Overheating or shaking will cause haemolysis or clotting.

Preserved blood must be filtered before administration to remove small amounts of fibrin which may form during storage. The filter for this purpose is incorporated in the dispensing apparatus provided with the Vena Flask.

Plasma may be obtained if required by simply syphoning off the supernatant fluid from the flask and rebottling.

Administration

Transfusion can only be a simple procedure if adequate restraint of the dog is effected. The vein of choice is the radial vein on the medial aspect of the fore leg. The dog is laid on its side and the lower fore limb securely bandaged to a plain wooden splint, which is long enough to project 6 in. beyond the foot and so provide a handle for control by the operator.

If the patient is really ill, no further restraint will be required, but if necessary an assistant can control the dog's head.

The area of the vein is clipped and sterilized and the vein raised by a quick-release rubber tourniquet.

The simple but ingenious apparatus known as "Edward's Vein Seeker" illustrated here, greatly minimizes the difficulty of keeping the needle securely in the vein during any small movement of the animal or apparatus which may be unavoidable.

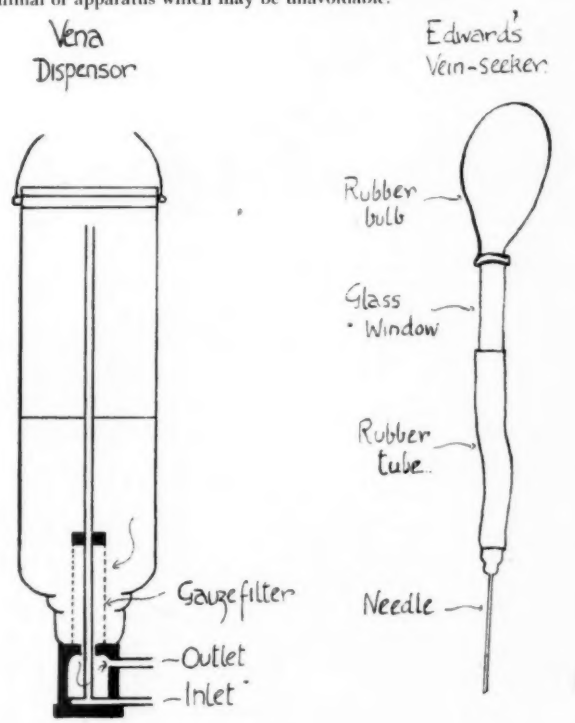

Fig. 2.

The vein seeker is filled completely with sterile citrate solution. Its length enables the butt of the needle to be held between the thumb and forefinger, while the bulb is compressed between the third and fourth fingers and the palm of the hand. This empties the bulb but leaves the tube and needle full of citrate. The needle is inserted under the skin and the bulb released. The vein is now sought with the needle and the bulb will remain collapsed until the lumen is entered when the negative pressure in the bulb will draw blood into the tube. When blood appears at the glass window the whole apparatus is strapped *in situ* with strips of elastoplast.

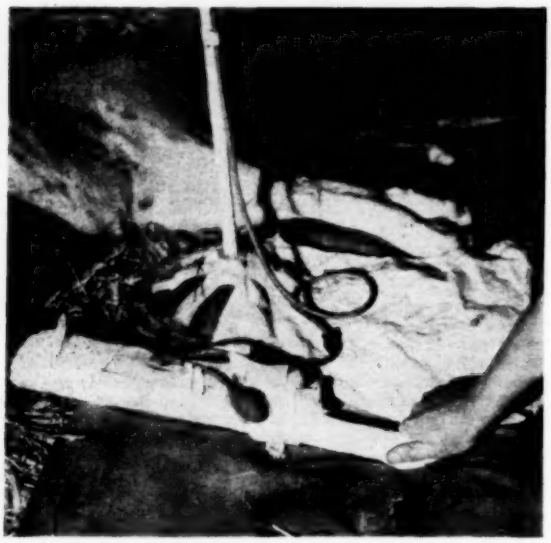

Fig. 3.—Illustrating Edwards' Vein Seeker *in situ*, and restraint of leg.

The rubber connection of the seeker has now become in effect a large and accessible vein on the surface, and the delivery needle can be readily inserted into this tubing and trusfusion commenced.

The rubber tubing grips the delivery needle securely, and allows a large freedom of movement which is not transmitted to the needle in the vein.

The rate of flow is regulated by a screw clamp on the delivery tube and should not exceed 15 c.c. per minute or 20 minutes for a 300 c.c. transfusion.

Transfusion should always be stopped while an inch of blood remains in the bottle to avoid any possibility of an embolism.

Transfusion Reactions

The transfusion of blood may give rise to a reaction in the recipient which is usually mild, but may be severe or even fatal. These reactions are classified into two groups—haemolytic and non-haemolytic—and are more frequent with stored blood than with fresh.

1. *Haemolytic reactions.*—The available evidence indicates that incompatibility of blood groups occurs very little, if at all, in domestic animals. There is some possibility, however, that the intensive inbreeding which produces some of our most valuable canine patients may also develop specific blood groups among them, so that close relatives from the same kennel should not be used as donors.

As a safeguard in cases of doubt direct matching of blood on a slide is a very simple procedure and should be carried out.

2. *Non-haemolytic reactions.*—These are frequent and probably occur in 50 per cent. of all transfusions. They are believed to be due to the introduction of foreign protein in the form of blood clot, or bacterial contaminants, and are more common if a patient has been sensitized by previous transfusions from the same donor.

In severe cases the recipient dies with the symptoms of acute anaphylaxis, but generally the reaction is mild and amounts to no more than a moderate pyrexia over a 24-hour period. This may be accompanied by rigors, vomiting or urticarial manifestations. No such severe reactions have been encountered in dogs by the author.

Scrupulous cleanliness of all apparatus is essential to avoid these untoward sequelae, and it is of prime importance to employ distilled water when making the citrate solutions.

If repeated transfusions from the same donor are unavoidable, the recipient may be desensitized by the intravenous injection of 0·5 c.c., 1 c.c., 2 c.c., and 5 c.c. of the donor's blood at five-minute intervals.

If reactions occur during transfusion, the administration must be stopped immediately. The patient should be placed in a warm situation and 2 c.c. adrenaline injected intramuscularly.

Technique of Direct Matching of Bloods

Collect 2 c.c. of the recipient's blood, allow to clot, and pour off the serum into another tube.

Two drops of the donor's blood are drawn into a syringe containing 2 c.c. citrate solution as a dilutor and well mixed.

Two drops of the recipient's serum are placed on a slide or white tile, and two drops of the citrated donor's blood dropped on to it and mixed.

Allow to stand for five minutes and then rock gently. If agglutination occurs it is readily visible to the naked eye.

Discussion

This method of transfusion has been evolved in the course of ordinary general practice and has proved satisfactory. Practicability has been the keynote, and there is probably much detail which could be improved or adapted by the ingenuity of the individual operator. Once the method is familiar, collection and storage can easily be made a routine "chore" for one evening a week or Sunday, and a modest but adequate "blood bank" could readily be maintained by any establishment with pretensions to being a veterinary hospital which carried a trained staff.

Several alternative methods of collection have been advocated, particularly by American authors, such as cannulating the left ventricle through the chest wall, or the carotid artery in the neck. These suffer from the disadvantage that they involve the destruction of the donor. In this country the keeping of a dog as a blood donor is not regarded as coming under the regulations controlling vivisection, provided that the animal is kept alive.

The possibilities of transfusion in the larger animals have been explored recently in the *Record* and need no further advocacy. The technique is exactly similar and proportionately easier to carry out, and the Vena Flask is eminently suited for the purpose by virtue of its size and robustness and the easy change over from collection to administration which enables direct transfusion to be carried out under "farmyard" conditions with absolute sterility.

While blood transfusion in cats would seem to have obvious value in cases of cat 'flu, with its attendant agranulocytosis, the only method which the author has witnessed has been one developed for experimental purposes by a member of the Army blood transfusion service. This is certainly a possible procedure, but the refinement of technique necessitated by the small size of the veins places it out of the realms of practicability for the harassed and usually hurried practitioner.

QUALITY BASIS FOR MILK PAYMENTS

"On principle, nearly everyone is agreed that milk should be paid for on the basis of quality, taking butterfat and non-fatty solids into account. But how to apply a system universally is the difficulty," observes the *Farming News* in its issue of November 7th, and proceeds: "Had the Ayrshires and other breeds at London Dairy Show not been credited with butterfat in the performance tests, there would have been no Scottish victory last week and no boost of the Ayrshire breed on the eve of this week's important series of sales.

"The Society of Dairy Technology discussed this question of payment on quality in London on the day preceding the opening of the Dairy Show. As a Jersey breeder, Dr. R. W. Wheldon, Durham University, strongly advocated quality payment. One year of quality payments, says Dr. J. G. Davis, might achieve what the Milk and Dairies Order has failed to achieve in 20 years. The difficulties were stressed by Mr. J. L. Davies, assistant general manager of the M.M.B. Compositional quality cannot be measured, he says, unless tests are made of every consignment every day. Mr. George P. Ross, Glasgow, asserts that bulked milk in Scotland has an average of 4·1 per cent butterfat. Professor H. D. Kay, Reading, suggests avoidance of daily tests by having three categories based on fortnightly tests. Category A would get full price: B say 2d. per gallon less and C 4d. less

* * * * *

Weekly Wisdom

Hon. Members ought not to engender more heat than they can contain.—Mr. Speaker.

CLINICAL COMMUNICATION

Clinical Observations on the Use of "Luteinising Hormone" (Chorionic Gonadotrophin) in the Treatment of Ovarian Cysts in the Bovine

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The original observations of Smith & Engels (1927) and Aschheim & Zondek (1927) on the role of the anterior pituitary gland in the control of gonadal activity, have been expanded by subsequent researches so that it is now permissible to ascribe the main phenomena of cyclic ovarian activity to two separate gonadotrophic hormones produced by the anterior pituitary gland, one of which is follicle stimulating in action and promotes growth of the follicle after the formation of the antrum, while the second, being luteinizing in action, is responsible for final maturation of the follicle, ovulation and the subsequent development of the corpus luteum.

The isolation of a gonadotrophic substance possessing marked luteinizing properties from the urine of pregnant women, and the isolation from the serum of the pregnant mare of a gonadotrophic substance having predominantly follicle stimulating properties, have provided the clinician with agents which, by virtue of their selective activity, may be employed in the control of cyclical ovarian activity and for the correction of ovarian dysfunction. The gonadotrophin of pregnancy urine (P.U.) is known as chorionic gonadotrophin, while that of mares' serum is usually referred to directly as pregnant mares' serum (P.M.S.).

As long ago as 1932 Tutt suggested the use of luteinizing hormone as being the rational therapeutic approach to the treatment of ovarian cysts in the cow, but there have been few published observations by workers in this country on the value of such treatment. Hignett (1941), without giving details, quoted reports of the successful treatment of ovarian cysts in the cow with large doses of Prolan in oil; Murray (1943) reported unfavourably on the treatment of three cases with large doses of Antuitrin-S, while Spriggs (1945) found the subcutaneous injection of 1,000 to 2 000 i.u. chorionic gonadotrophin completely ineffective.

Reports from America have been more extensive, and generally more encouraging. Deubler (1943) reported excellent results following the subcutaneous injection of 10,000 units Antuitrin-S. A more complete study of the value of gonadotrophins was made by Casida *et al.* (1944) using a sheep pituitary gonadotrophin whose action was shown to be predominantly luteinizing. These workers emphasized the superiority of the intravenous route for the administration of gonadotrophins when their activity is directed to the induction of ovulation in cattle. Ninety-six animals were treated by the intravenous injection of an unfractionated extract equivalent to about 1 gramme sheep pituitary gland, dissolved immediately before use in 10 c.c. distilled water. Of 81 animals which showed nymphomania when treatment commenced 72 were restored to normal behaviour after the first injection although symptoms recurred in 14. Normal oestrus was shown by 69 after one injection and 36 of 53 animals served following a single injection became pregnant. Of 15 animals re-treated because of recurrence or persistence of cysts, six conceived, while three animals served following a third injection proved barren. Corpora lutea were recognized in 74 animals within 31 days of treatment. The authors concluded that the results indicated a positive action of pituitary gonadotrophin upon cystic ovaries. Lentz (1945) reported on the treatment of 30 cows with cystic ovaries, 24 of which showed nymphomania and six of which had failed to show heat. The animals were treated by the intramuscular injection of 10,000 units chorionic gonadotrophin and 21 of the 24 nymphomaniac cattle settled to service, while five of the six which had failed to show heat became pregnant following treatment. Moore (1946) treated 18 cows showing ovarian cysts by the intravenous injection of 1,000 i.u. chorionic gonadotrophin and effected a return to normal sexual cycles in 17 out of 18, 12 of which became pregnant after one or two injections.

The findings published below cover observations made on the treatment of 12 animals with Luteinising Hormone ("Wellcome" brand Chorionic Gonadotrophin).

Five of the animals showed nymphomania and in two of these the condition could be attributed to the use of synthetic oestrogen. Six of the animals either failed to show heat or exhibited irregular heat periods, and one animal showed a normal oestrous cycle.

The gonadotrophin was dissolved immediately before use in 10 c.c. distilled water and injected intravenously in doses of 800 to 3,200 i.u.

Results

Of the 12 animals treated, the normal ovulatory cycle was restored after a single injection in eight cases, while two further animals responded to a second injection. Two animals failed to respond after two injections; of these one failed to respond after seven injections of a total of 13,000 i.u. Luteinizing Hormone given over a period of eight months, while the second responded after a third injection.

Five animals showing nymphomania were all restored to normal sexual behaviour by a single injection. Of the 12 animals, seven became pregnant after a total of eleven services or inseminations.

	Pre-treatment observations			Post-treatment observations			
Case No. Subject	Date of oestrus	Cysts recognized	Date of oestrus	Date of examination	Left ovary	Right ovary	Treatment and remarks
1. Ayrshire cow	Constant oestrus Aug. to Oct., 1945	2.8.45 17.8.45 24.8.45 21.9.45 27.9.45 19.10.45	26.10.45 (A.I.) 23.11.45 (A.I.) 13.12.45 (A.I.)	9.11.45 1.12.45 18.1.46	C.L. C.L. Cyst		1,600 i.u. L.H. 1,600 i.u. L.H.
2. Ayrshire cow	2.1.45 23.1.45 25.1.45 27.2.45 18.3.45 24.4.45 31.8.45	2.8.45 17.8.45 24.8.45 12.10.45 19.10.45	2.11.45 (A.I.) 23.11.45 (A.I.) 12.12.45 (A.I.)	2.11.45 12.11.45 6.12.45	Follicle C.L. C.L.		1,600 i.u. L.H. 1,600 i.u. L.H.
3. Guernsey cow. C. Dec., 1944	Not recorded	8.11.45	19.11.45 (S.)	15.11.45 29.11.45 26.1.46		Cyst C.L.	1,600 i.u. L.H. Pregnant
4. Guernsey heifer. Aborted 9.9.45	Constant oestrus Sept. to Nov., 1945	Not recorded	12.12.45 2.1.46 23.1.46 (S.)	15.11.45 29.11.45 21.3.46	Cyst C.L.	Cyst	1,600 i.u. L.H. Pregnant
5. Ayrshire cow. C. 2.3.45	30.4.45. Anoestrous to Dec., 1945	27.9.45 10.11.45	7.12.45 (S.) 19.1.46 (S.)	15.11.45 29.11.45 9.2.46 25.3.46	Cyst C.L. C.L.		1,600 i.u. L.H. 1,600 i.u. L.H. Pregnant
6. Ayrshire cow. C. 16.1.45	4.5.45. 20.7.45 Subsequent irregular cycle not recorded	13.3.45 27.7.45 10.11.45	16.11.45 (S.) 5.12.45 (S.)	15.11.45 29.11.45 6.12.45 9.2.46	C.L.	Cyst	1,600 i.u. L.H. 1,600 i.u. L.H. Pregnant
7. Jersey cow. C. 4.1.45	9.9.45 2.10.45 23.10.45 Constant oestrus 13.11.45 to 17.11.45	Not recorded	17.12.45 (S.) 11.1.46 (A.I.) 8.2.46 28.2.46 23.3.46 (A.I.)	21.11.45 7.1.46 18.1.46 26.1.46 20.2.46 15.3.46 3.5.46	Cyst C.L. Cyst C.L.	Cyst	1,600 i.u. L.H. 25 mg. S/D. 1,600 i.u. L.H. Pregnant
8. Friesian cow. C. Sept., 1944	4.2.45 18.7.45 Constant oestrus 20.12.45 to 22.1.46	23.12.45 1.1.46 8.1.46	8.2.46 (S.)	22.1.46 14.4.46	Cyst	2 Cysts	1,600 i.u. L.H. 1,600 i.u. L.H. Pregnant
9. Ayrshire heifer	Completely anoestrous	Not recorded		15.2.46 16.2.46 26.2.46 6.3.46 15.3.46 26.3.46	Cysts Cyst	Cyst Cyst Cyst	1,600 i.u. L.H. 3,200 i.u. L.H. 3,200 i.u. L.H.

Case No.	Subject	Pre-treatment observations: Date of oestrus	Pre-treatment observations: Cysts recognized	Post-treatment observations: Date of oestrus	Post-treatment observations: Date of examination	Post-treatment observations: Left ovary	Post-treatment observations: Right ovary	Treatment and remarks
10.	Guernsey heifer	15.11.45	Not recorded		1.4.46		Cyst	1,600 i.u. L.H.
		24.11.45			14.5.46		"Lut. cyst"	25 mg. S/D.
					28.5.46		"Lut. cyst"	25 mg. S/D.
				Constant oestrus 3.6.46 to 25.6.46				
					25.6.46		Cyst	800 i.u. L.H.
				17.7.46 (S.)				
					5.9.46	C.L.		Pregnant
11.	Jersey cow. C. March, 1946	12.5.46	Not recorded		14.12.46		Cyst	1,000 i.u. L.H.
		29.5.46			21.12.46		2 Cysts	
		16.6.46		9.1.47 (S.)				
		28.6.46		21.1.47 (S.)				
		29.7.46			7.2.47		C.L.	
		13.8.46		9.2.47 (S.)				
		29.9.46		28.2.47 (S.)				
		11.10.46			4.3.47		C.L.	
		5.11.46						
		20.11.46						
12.	Jersey cow. C. Dec., 1945	24.2.46	Aug., 1946		14.12.46		Cyst	1,000 i.u. L.H.
		23.8.46			21.12.46		Cyst	
		30.10.46			7.2.47	Cyst		1,000 i.u. L.H.
		23.11.46			28.3.47	Cyst		1,500 i.u. L.H.
				12.4.47 (S.)				
					23.4.47		C.L.	
					24.5.47		C.L.	Not pregnant

C. = Calved. L.H. = "Luteinising hormone."
A.I. = Inseminated. S/D. = Stilboestrol dipropionate.
S. = Served. C.L. = Corpus luteum.
N.B.—Date of treatment indicated by parallel date of oestrus or examination.

DISCUSSION

Case 1.—This animal had a long history of breeding failure and extensive pathological changes in the genital tract including a marked bilateral salpingitis, could be detected on rectal palpation.

Ovulation occurred after a single injection of Luteinising Hormone and the signs of nymphomania present when hormone therapy was begun disappeared within 48 hours. A normal 21-day period followed a second injection, but cysts recurred and one was observed even following a third injection of 3,200 i.u.

This animal was slaughtered as infertile and the pathological changes noted on rectal examination were confirmed on *post-mortem* examination.

Case 2.—This animal had a long history of infertility which, for several months prior to treatment, was associated with anoestrus and the presence of ovarian cysts. Although return to oestrus on 31.8.45 was induced by repeated rupture of the cysts, recurrent cycles were not secured, but a series of normal ovulatory cycles followed treatment with Luteinising Hormone on 2.11.45. At this time it appeared possible that all the effects of treatment might not be maintained over successive cycles, and in an attempt to ensure ovulation the administration of Luteinising Hormone was repeated at the succeeding oestral period, but subsequent observations indicate that once ovulation and luteinization have been effected, the ovarian rhythm is restored, and recurrent ovulatory cycles can be expected, thus the second injection was probably unnecessary. The time relation between oestrus and ovulation was studied over seven cycles and appeared to be normal in every case. Repeated inseminations proved infertile and the animal was slaughtered. The only *post-mortem* lesions were very inconspicuous bursal adhesions and no explanation for her persistent infertility can be offered.

Case 3.—This animal had apparently shown no marked irregularity of the oestrous cycle, but had persistently returned to service throughout 1945. She conceived to service at the first oestrus after treatment.

Case 4.—This animal showed nymphomaniacal behaviour and marked masculinization after the abortion of a mummified foetus had been induced by the parenteral administration of stilboestrol dipropionate. The return to normal behaviour within 48 hours of treatment and the immediate recession of male characteristics were particularly striking.

Case 5.—The resumption of sexual activity within 23 days of treatment following upon the animal's failure to show heat throughout the summer and autumn of 1945 seems acceptable as evidence of the value of Luteinising Hormone for the treatment of anoestrus associated with ovarian cysts. It is to be noted that following the first unsuccessful service after injection, a second dose of 1,600 i.u. was made 21 days after the second service in anticipation of a third oestrus. In fact, the animal proved to be pregnant and the second injection was probably redundant.

Case 6.—No detailed history was available for this animal, but apparently her cycles had been irregular throughout 1945 until the time of treatment. The animal was in oestrus at the time of the first treatment, but the service permitted proved to be infertile. The administration of a further 1,600 i.u. Luteinising Hormone at the succeeding fertile oestrus was again probably redundant.

Case 7.—This animal had exhibited a long *post-partum* anoestrous period associated with ovarian cysts. Heat was first noted on 9.9.45 after repeated manual rupture of the cysts per rectum and recurred twice at normal intervals, but this period of normal activity was then terminated by the appearance of nymphomaniacal behaviour with masculinization. When treatment commenced the animal had been housed for four days and no up-to-date subjective evidence of her condition was obtained. A single injection of 1,600 i.u. Luteinising Hormone was followed by normal oestrus and ovulation, but the service permitted proved infertile. She was then admitted to the hospital and daily observations made for evidence of oestrus. Two ripening follicles could be detected on 10.1.46, a vaginal discharge characteristic of oestrus was present, but semen for insemination was not available and insemination was not carried out until late the following day when all physical signs of oestrus had disappeared.

Seven days after insemination a gross pyometra was apparent and cultural examination of vaginal discharge yielded haemolytic staphylococci. Routine bacteriological examination of the semen used for insemination had shown the presence of large numbers of haemolytic staphylococci and the findings suggest that the introduction of infected semen into a uterus lacking the physiological barrier to bacterial invasion which is probably present at oestrus, may have been responsible for the appearance of the infection in a previously healthy uterus. Although the history of the animal suggested that the ovarian cycle might readily be deranged by oestrogen therapy, 25 mgm. of stilboestrol dipropionate in oil were given intramuscularly and eight days later a cyst was again recognized in one ovary.

The evacuation of the pus was rapid and uterine involution almost complete eight days later when 40,000 units penicillin in 100 c.c. water were introduced into the uterus.

Following the recurrence and rupture of a second cyst, 1,600 i.u. Luteinising Hormone were again administered intravenously and normal cycles were re-established, the animal conceiving to insemination performed at the second oestrous period.

It appears probable that the reappearance of ovarian cysts in this animal after the successful initiation of normal ovulation by chorionic gonadotrophin was due to the administration of stilboestrol dipropionate in the treatment of pyometra.

Case 8.—This case is again particularly illustrative of the efficiency of Luteinising Hormone in suppressing the nymphomania associated with ovarian cysts. The animal was in constant oestrus for the 33 days immediately preceding treatment. Oestrus disappeared within 48 hours of injection and service at the first oestrous period 17 days later proved fertile.

Case 9.—This animal is of interest in that there was a complete absence of any ovarian response to the repeated intravenous injection of Luteinising Hormone in doses up to 3,200 i.u. A total of 13,000 i.u. was given in seven injections over a period of eight months without affecting the clinical picture in any way. There was no evidence of sensitization with repeated dosage although anaphylactic shock has been recorded by Bottomley *et al.* (1940), who reported that four intramuscular injections of chorionic gonadotrophin were apparently responsible for the sensitization of a heifer which died within a few hours of the administration of an intravenous dose eleven days after the last intramuscular injection.

Case 10.—This heifer is of particular interest in that the intravenous injection of 1,600 i.u. Luteinising Hormone produced what appeared, on rectal examination, to be complete luteinization of a cyst about 2 in. in diameter. Palpation per rectum revealed a firm spherical body 2 in. in diameter, with no tendency to fluctuate, no evidence of an ovulation point and which resisted all efforts at enucleation. The intramuscular injection of 25 mgm. stilboestrol dipropionate was without effect except for a reduction of the "luteinized cyst" to about half its original size. The administration of a similar dose 14 days later, however, resulted in oestrus

which persisted with masculinization and typical nymphomania. This behaviour had persisted for 22 days when a further 800 i.u. Luteinising Hormone were given intravenously. Oestrus disappeared within 48 hours and service at the oestrus which recurred 22 days later proved fertile.

Case 11.—A recurrent ovulatory cycle was initiated after a single injection of 1,000 i.u., but repeated services were infertile. Pathological changes in the uterus were first evident on 28.3.47 and cystic degeneration of the left Fallopian tube was apparent when examined on 26.4.47. This animal was condemned as sterile.

Case 12.—This animal showed a response to the injection of 1,500 i.u. Luteinising Hormone after two previous injections each of 1,000 i.u. had proved ineffective.

Summary

1. Clinical observations have been made on 12 cows and heifers showing ovarian cysts which were treated by the intravenous injection of 800 to 3,2000 i.u. chorionic gonadotrophin ("Luteinising Hormone").

2. Five animals showing nymphomania have been treated. In two of these animals the condition could be attributed to the parenteral administration of synthetic oestrogens.

3. Some response which could be attributed to the treatment was obtained in eleven out of twelve animals. All of five animals showing nymphomania were restored to normal behaviour.

4. Of the 12 animals, seven became pregnant after a total of eleven services or inseminations.

5. One animal which responded with ovulation after a single injection of 1,600 i.u. showed a relapse after treatment of a pyometra by the intramuscular injection of 25 mgm. stilboestrol dipropionate, but became pregnant after restoration of the ovarian cycle by a second injection of 1,600 i.u.

6. One animal failed to show any response to a total dosage of 13,000 i.u. given in seven injections over a period of eight months.

7. Pathological changes were recognizable in the Fallopian tubes of two animals which failed to become pregnant to repeated services after treatment.

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EQUINE INFECTIOUS ANAEMIA OR SWAMP FEVER

The Bureau of Animal Industry of the U.S. Department of Agriculture, in a report on the above, arising from recent losses of valuable horses in New England from this cause, quote the warning of the Department's veterinary officers that equine infectious anaemia can easily be spread from an infected to a healthy animal by unsterilized hypodermic syringes, bleeding needles, or other instruments that have been contaminated with the blood of an infected horse. The Department advise that inoculations and related treatments should preferably be given by a veterinarian skilled in the use of such instruments and in sanitary procedure. The cause is a virus present in the blood of animals infected with the disease. "The chief symptoms of infectious anaemia are loss of weight, weakness, recurring fever, and swellings on the abdomen and legs. In the acute form of the disease the animal seldom lives over 15 to 30 days. More often the infection develops into a chronic condition marked by intermittent attacks of fever and weakness. No dependable cure or preventive vaccine has yet been developed and, so far as known, an animal when once infected is always infected. The Department's Bureau of Animal Industry reports cases, observed in experimental studies, in which chronically affected horses remained infectious for periods of 14 and 15 years."

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occasion when an unsuspected and unsuspecting maggot was dredged up from the depths of the external auditory meatus.

These few notes are submitted in the hope that they may be of interest and use to members who have not used suction in surgery. My thanks are due to W. H. Wilson, Esq., for taking the photograph. The apparatus, with the exception of the home-made adaptor, was supplied by Messrs. Chas. F. Thackray, of Leeds. It is inexpensive, the cost of the Gray's pump and angulated nozzle together being a little over £2.

NEW INSTRUMENTS AND APPLIANCES

The Use of Suction in Small-animal Surgery

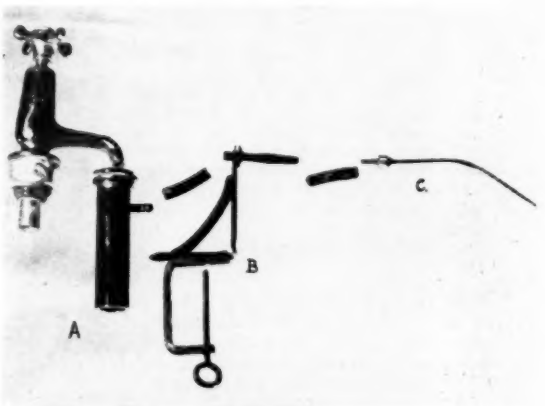
N. Robert Turnbull, M.R.C.V.S.
Basingstoke

Suction apparatus in one form or another has long been a routine article of equipment in most human operating theatres. The object of these brief notes is to describe a simple suction apparatus I have found useful, and to review some of the uses to which it may be put in small-animal practice.

I.—The Apparatus

This consists of a Gray's water suction pump to fit any round section ½ in. tap. (A) This is connected by an appropriate length of thick walled tubing to a home-made adaptor manufactured from a table-tennis clamp, an angle bracket and the nozzle of a Higginson syringe (B). This adaptor can be secured on to the edge of the operating table in any convenient position. The rest of the apparatus consists of a further length of tub.ng (about 3 ft.) and an angulated nozzle (C). This latter part of the apparatus, *i.e.*, final tubing and nozzle, may be sterilized with other instruments and attached to the Higginson nozzle without breaking asepsis.

The apparatus is set in motion by turning on the tap when a considerable suction takes place at the nozzle end.



II.—Uses

(*a*) Clean, *i.e.*, use during an aseptic operation.

The pump and adaptor are placed in position before starting the operation. The final tubing and nozzle are sterilized with the instruments and are connected to the adaptor by the operator by the simple means of pushing the tube over the end of the Higginson nozzle. The tap can be turned on at any given moment by an "unclean" assistant.

Its use in aseptic surgery is principally to remove excess blood in operations whence frequent swabbing is undesirable or inconvenient. It can also be used to remove small blood clots from a surgical wound prior to suturing.

(*b*) Unclean

(i) *Oral Sepsis.*—After large-scale extractions and scaling, this apparatus is valuable in removing particles of scale, food, hairs, etc., from between teeth and removing blood, etc., from the mouth and pharynx.

(ii) *Wound Treatment.*—Suction may be used to remove, without further trauma, pus, slough, etc., from dirty wounds; it will also remove small foreign bodies such as particles of grit which frequently resist vigorous swabbing.

(iii) *Ears.*—In the treatment of all forms of dirty ears I have found this technique most valuable. The usual technique of cotton wool swabs on sinus forceps frequently has the effect of pushing detritus down the ear canal instead of removing it, and often causes severe trauma of already inflamed tissues. Suction will gently remove debris and discharges with a minimum of discomfort to the patient.

When used in conjunction with an aural speculum even individual otodectes may be hunted down and sucked into eternity. Sometimes larger game may be captured as on one memorable

(*Concluded at foot of previous column*).

ABSTRACTS

[The Use of D.D.T. in Dips to Control Cattle Tick. Hitchcock, L. F., & Mackerras, I. M. (1947.) *J. Counc. Sci. and Ind. Res.* (Australia). **20**. 43-55.]

During recent years cattle-owners in parts of Queensland have experienced increasing difficulty in controlling ticks (*Boophilus microplus*) with arsenical dips as some degree of arsenic-resistance would appear to have developed in the tick population.

The authors describe experiments showing that D.D.T. preparations provide a control of these parasites. In preliminary toxicity trials one animal received, in 14 weeks, seven 25 g. doses of D.D.T. in aqueous suspension by stomach tube while another received three 50 g. doses in six weeks without ill effect. Fortnightly dosing of 50 g. D.D.T. in 200 ml. eucalyptus oil and liquid paraffin also proved innocuous, though continued for six months. Finally, 18 young Hereford steers were inuncted along the back weekly with 22·5 g. D.D.T. in 300 ml. peanut oil and after 51 weeks the cattle still showed no ill effect.

In the dipping trials the preparation finally adopted was a 50 per cent. preparation D.D.T. incorporated in a "solubilizer." This preparation when diluted gave a stable aqueous suspension of fine particle size. Preliminary spraying trials showed that a strength of 0·5 per cent. D.D.T. gave a very good kill and protected for about ten days. Increase of strength to 2 per cent. increased the protective period to about 15 days. The semi-engorged nymphs were the most resistant, the other stages being highly susceptible.

The dipping trials were carried out with large herds on four farms and 0·5 per cent. D.D.T. was used. Cattle showed no ill effects from the dippings. The kill of ticks was slow, but after one week a complete kill was observed in 70 per cent. of animals examined. Protection varied from eight and a half to 18 days, but in all cases it was observed that, for several days after dipping, invading larval ticks were killed. The authors suggest that the dipped cattle act as poison baits, collecting larvae from the pastures, and may thus have a profound effect on the general tick population. After preliminary dippings have established control, they suggest that dipping at intervals of two months or more may be sufficient to maintain it.

H. E. H.

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[The Persistence of D.D.T. on Cattle. Hackman, R. H. (1947.) *J. Counc. Sci. and Ind. Res.* (Australia). **20**. 56-65.]

D.D.T. has been shown to be a very valuable insecticide against major cattle pests, for the effective control of which some degree of persistence of D.D.T. on the animals is required.

The author describes experiments to measure persistence by chemical and biological assay of clipped hair samples, and produces evidence to show that licking (either by the animal concerned, or by another animal) is by far the most important cause of removal of D.D.T. from the hair. Other causes investigated were the effect of solar radiation, rain, growth and loss of hair, rubbing, production of skin secretion, absorption into skin and hair, and flaking of epithelium, but these all played only a minor role.

Under field conditions deposits on living cattle surfaces remain effective for only one to two weeks and it is clear that, as the major part of the D.D.T. is removed by licking, no additional protection is likely to be gained by increasing the strength of insecticide. The amount of D.D.T. ingested by licking would not be sufficient to produce toxic symptoms.

[*Abstractor's Note.*—Persistence of insecticides on sheep's wool, from which removal by licking is out of the question, is very much greater than on cattle hair. The leaching effect of rain is probably the most important cause of loss, but, generally, persistence of substantial amounts of insecticide for several weeks can be expected in sheep.]

H. E. H.

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Erratum.—Professor P. Goret, of the Lyons Veterinary School, writes as follows in connection with the abstract, published in our issue of July 26th, of his article (*Ann. Inst. Pasteur.* **72**. 53-57), in which is recorded his work on the adsorption of the virus of Carré: "What was inoculated into the eight ferrets in the experiment was not the hydroxide-virus preparation but the *supernatant liquid* after centrifuging the preparation. Its lack of virulence then proves the adsorption of the virus. But the preparation in its fresh state is, in every case, virulent. *Its virulence disappears only after desiccation* which constitutes the interesting fact in the note. This error is very excusable and proves that this fact is not made clear in my publication, which is why I take the liberty of bringing the matter to your notice."

QUESTIONS IN PARLIAMENT

Fowl Pest

Mr. Emrys Hughes asked the Secretary of State for Scotland if he has considered a protest from the Scottish National Poultry Council, a copy of which has been sent to him, expressing anxiety that fowl pest may spread in Scotland following the importation of quantities of turkey and poultry meat from Hungary into Glasgow; and what precautions he intends to take.

Mr. Woodburn: I have considered the protest referred to in consultation with my right hon. Friends the Minister of Agriculture and Fisheries and the Minister of Food, and I understand that no Hungarian poultry has been imported into Glasgow. As regards these imports generally, most careful precautions are taken, and as the carcases are now imported ready for the pot, the risk of infection from the residue is very slight, particularly as any such residue fed to poultry is required by regulation to be boiled.

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Animal Experiments (Transport)

Mr. Viant asked the Secretary of State for the Home Department whether his attention has been called to the recent despatch from Eire to Cambridge University Physiological Department of eight cats in an orange box, five being so badly injured during transit under such conditions that they had to be destroyed; and whether he will impress upon the licensees under the Cruelty to Animals Act. 1876, the importance of guarding against suffering to laboratory animals, apart from that permitted during actual experiments.

Mr. Ede: I understand that the dealer who was responsible for the despatch of these animals was prosecuted in Eire and convicted. I am in full agreement with my hon. Friend as to the need for a proper standard of care for animals acquired for laboratory purposes, and the importance of this is well recognized by those who hold licences under the Act of 1876 and by the Home Office inspectors.

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Livestock (Spraying)

Mr. Skeffington-Lodge asked the Minister of Agriculture to what extent his Department has encouraged the use of DDT or similar preparations for spraying livestock both with the object of preserving their hides and their health, as well as saving them from unnecessary cruelty inflicted on them by flies and other insects in hot weather.

Mr. T. Williams: I am advised that DDT and similar preparations when used as sprays on livestock have a very limited value as protectives against flies and other insects, although as dips for sheep they are proving very successful. The Ministry's veterinary officers generally recommend the use of these products for suitable purposes.

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Self-Suppliers' Pigs (Slaughter)

Mr. Challen asked the Minister of Food what steps he is taking in connection with the self-suppliers pig scheme to ensure that pigs kept by cottagers and other private individuals under this scheme are always slaughtered by humane methods; and whether he proposes to take any additional steps to prevent unnecessary cruelty.

Mr. Strachey: A good proportion of self-suppliers' pigs are slaughtered at Ministry of Food slaughterhouses or bacon factories where humane slaughter is the rule. Self-suppliers who kill their pigs elsewhere, are, of course, subject to the Common Law as to cruelty to animals.

ROYAL SOCIETY AWARDS

The King has approved the recommendations of the Council of the Royal Society for the award of Royal Medals for the current year to Professor C. N. Hinshelwood, F.R.S., for his distinguished work on the mechanism of chemical reactions from the simplest gas phase processes to the complexities of cell division, and to F. M. Burnet, M.D., F.R.S., for his distinguished work on bacteriophages, viruses, and immunity, and for his contributions to the study of infectious disease as an ecological phenomenon. The Royal Society has awarded the Copley Medal to Professor G. H. Hardy, F.R.S.; the Davy Medal to Professor L. C. Pauling; the Buchanan Medal to Sir Edward Mellanby, K.C.B., M.D., F.R.S., F.R.C.P., Secretary of the Medical Research Council; and the Hughes Medal to Professor J. F. Joliot.

NOTES AND NEWS

Diary of Events

Dec. 1st.—105th Annual Meeting of the Farmers' Club, at the Royal Empire Society (Dr. R. E. Slade : "The Conservation of Fodder Crops for Winter Feeding"), 2.30 p.m.

Dec. 3rd.—Meeting of the Association of Veterinary Teachers and Research Workers (Scottish Regional Group), at the Glasgow Veterinary College (83, Buccleuch Street), 2.30 p.m.

Dec. 4th.—Meeting of the Central Veterinary Society at the Royal Veterinary College, Camden Town (2 p.m.).

Dec. 10th.—R.S.I. "Benjamin Ward Richardson" Lecture, at the Institute, Buckingham Palace Road, S.W.1: "The Transport, Handling and Lairage of Animals intended for Slaughter," by C. G. Allen, M.R.C.V.S., D.V.S.M., Chief Veterinary Officer, Birmingham. Professor Geo. H. Wooldridge, F.R.C.V.S., M.R.I.A., in the chair ; 2.30 p.m.

Dec. 10th.—Meeting of the South-Eastern Division, N.V.M.A., at Beckenham (Wellcome Physiological Research Station, Langley Court), 2.30 p.m.

Dec. 10th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool (Geology Lecture Theatre, Brownlow Street), 2.30 p.m.

Dec. 13th.—Meeting of the Biochemical Society, London School of Hygiene, Keppel Street, W.C.1, 11 a.m.

Jan. 6th, 7th, 8th and 9th, 1948.—Quarterly and special meetings of Council, R.C.V.S., 10, Red Lion Square, W.C.1.

Jan. 14th, 15th and 16th, 1948.—Meetings of Committees and Council, N.V.M.A. Committees at 36, Gordon Square, W.C.1. Council (16th) at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2.

Feb. 19th and 20th.—Special meetings of Council, R.C.V.S., 10, Red Lion Square, W.C.1.

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PERSONAL

The Milk Marketing Board at their meeting on October 21st, 1947, unanimously resolved to co-opt Sir Frank Ware, C.I.E., F.R.C.V.S., as a member of the Board until June, 1948, in the place of Sir William Prince-Smith, resigned.

* * *

Births.—Gibbs.—On November 16th, 1947, to Barbara (*née* Dyke, M.R.C.V.S.), wife of Capt. W. A. Gibbs, M.R.C.V.S., Market Square, Leighton Buzzard—a son.

Heath.—To Effie, wife of G. B. S. Heath—a daughter.

Hewitt.—On November 18th, 1947, at Langrigge Nursing Home, Bowness, to Mary, wife of S. L. Hewitt, M.R.C.V.S., "Bridgelands," Ulverston—a son.

McLaren.—On October 23rd, 1947, at 94 British Military Hospital, Hamburg, B.A.O.R., to Isabella, wife of Major I. McLaren, R.A.V.C. —a daughter.

* * *

Professor Bressou Honoured.—The many members of the Association who were privileged to meet Professor and Mme. Bressou at the N.V.M.A. Congress in Edinburgh, will wish us to express, on their behalf, felicitations to the distinguished Principal of the Veterinary School at Alfort upon the bestowal of the decoration "Officier de l'Instruction publique."

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R.C.V.S. OBITUARY

Gray, William Macdonald, Veterinary Inspector, Portal Inspection Office, Londonderry, Northern Ireland. Graduated Glasgow, July 16th, 1937. Died November 18th, 1947 ; aged 35 years.

Stinson, Oscar, Inspector, Ministry of Agriculture and Fisheries, late practitioner at Marden, Kent, and Appleby, Westmorland. Graduated London, July 15th, 1910. Died November 20th, 1947 ; aged 59 years.

Mr. Oscar Stinson, M.R.C.V.S.

The death of Mr. Oscar Stinson, while yet in late middle life, will be deeply regretted by his many friends and colleagues not only in the Ministry, but in that field in which he had earned for himself while in country practice such wide repute as a bovine obstetrical surgeon and for his work in connection with the surgery of the teat. We hope to make fuller reference in an early issue.

The funeral took place at Parkside Cemetery, Kendal, on Monday last.

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LEGAL NOTES

Dog Shot when Chasing Sheep: Appeal Court's Directions to County Court Judge.—The Court of Appeal (Lord Justices Scott, Asquith and Evershed), reports *The Times* in its issue of November 19th, referred back to the County Court Judge a case in which the defendant, Mr. John Sirl, of Vale Farm, Halstock, Dorset, appealed against the decision of Judge Armstrong, sitting at Yeovil County Court, giving judgment for 30 guineas in favour of the plaintiff, Mrs. Frances Marion Cresswell, of Clover Field, Halstock, Dorset, in an action in which she claimed damages for the shooting, by the defendant, of a pedigree bull terrier bitch belonging to her.

The defendant was the son of a farmer, Mr. Charles Sirl. On the night of August 12th, 1946, after the defendant had gone to bed, his wife aroused him on account of the barking of dogs on the farm land. The defendant and his brother-in-law went out and found that two dogs were chasing and penning up the farmer's sheep. The brother-in-law shone a torch, whereupon the dogs left the sheep and came running towards the men. The defendant shot at one of the dogs, a light coloured dog, as it approached him, but in the darkness he missed it and he shot and killed the other, a bull terrier bitch.

As a result of the dogs chasing and barking at the sheep some of them, and also a sow, afterwards aborted, in respect of which Mr. Charles Sirl recovered damages against Mrs. Cresswell in other proceedings.

In the present case the defendant contended that he was justified in killing the dog as an act of necessity to protect sheep and sows belonging to his father, who was also his employer. He now appealed against the judgment in favour of Mrs. Cresswell.

Judgment

Lord Justice Scott, in reading the judgment of the Court, stated the facts, referred to the County Court Judge's judgment, and said the chasing by dogs which caused any real and present danger of serious harm to the animals chased constituted an "attack" which entitled the owner to take effective measures of prevention. The relevant rules of law might be stated thus:—

The onus of proof was on the defendant to justify the preventive measures of shooting the attacking dogs. He had to establish two propositions, each of which might be established in either of two ways: (1) That at the time of shooting the dog was (*a*) actually (in the above sense) attacking the animals in question, or (*b*) if left at large would renew the attack, so that the animals would be left presently subject to real and imminent danger unless renewal was prevented. (2) That either (*a*) there was in fact no practicable means, other than shooting, of stopping the present attack or preventing such renewal, or (*b*) that the defendant, having regard to all the circumstances in which he found himself, acted reasonably in regarding the shooting as necessary for the protection of the animals against attack or renewed attack.

The County Court Judge did not apply to the facts proved the proper tests. He regarded as conclusive in the plaintiff's favour his finding that at the moment of shooting no actual attack was in progress, and he had not applied himself to the question whether or not, at the time of shooting, the ewes were still in real and imminent peril. Nor was it clear whether he intended to find that, whether or not the shooting was in fact necessary, the defendant acted reasonably in so thinking.

The matter would be referred back with the following directions:—

If the Judge should find that the defendant had established both propositions in either of the alternative ways open to him, he should enter judgment for the defendant. But if he found that the defendant had not so established both propositions, the plaintiff would sustain her judgment.

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H.M. STATIONERY OFFICE PUBLICATIONS

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Public General Acts 10 and 11 Geo. 5 (Session, 1920): Ch. 46 Dangerous Drugs. (Reprinted 1947, revised price)	0 3	0 4

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents should write as briefly as possible and letters should not exceed 350 words.

POLIOMYELITIS AND VIRUS DISEASE OF DOGS

Sir,—Hamilton Kirk by being speculative has succeeded in luring at least two clinicians on to the controversial subject of encephalomyelitis of dogs!

I find myself in agreement with R. H. Smythe's differentiation of the three common infections of dogs which exhibit at times nervous phenomena, *viz.* (1) Kennel or shop disease, (2) Typical or atypical distemper, (3) Epidemic encephalomyelitis.

The rapidity with which affected animals in group (1) respond to sulphamezathine would appear to eliminate a virus as the causative factor. It is in the differential diagnosis of cases falling in groups (2) and (3) that the interest of the clinician is aroused. For many years I have contended that "distemper" as met with in the field consists of at least two clinical entities due to different viruses: (*a*) those occurring in group (2) due to Laidlaw Dunkin virus and those occurring in group (3) due to a virus that is non-transmissible to the ferret. I pointed out the similarity between this group 3 virus to R. G. Green's fox encephalitis virus. Green, in a private communication (December, 1936) to me, stated that he had "uncovered a canine encephalitis which appears to be distinct from that caused by the distemper virus or the fox encephalitis virus." The differentiation was based on variation of intranuclear inclusions in certain nerve cells. Whichever of these viruses we are dealing with, they all show the same tendency at times to a profound increase in their neurotropic properties and then after a varying period of time the general incidence of the disease makes itself felt more on some other parts of the body and as a result an atypical syndrome is built up. It is when these virus diseases are in their milder atypical phases that they become so inextricably mixed up as to make differential diagnosis almost an impossibility, anyway without the aid of a ferret. During those years when there is an exacerbation of the neurotropic properties of these viruses, the Press usually "import" a new disease to explain it, whereas in point of fact they are with us always in some form or other. In these circumstances the most that one can do is to point out that the encephalitis syndrome is not a disease *per se*, *i.e.*, aetiologically regarded, but merely a type of reaction which may be evoked by more than one virus ordinarily present in this country.

The last paragraph of Smythe's letter raises a point of considerable interest. Whereas I agree there are definite reasons to postulate a symbiotic virus to explain chorea, I frankly consider that demyelination of nervous tissue alone can explain the chorea picture. I recently saw a dog that had "recovered" from distemper over two years previously being left with a very mild choreic twitch in one hind leg. Then for no apparent reason the chorea became more profound and within two months the whole body became involved. Histological examination of the C.N.S. revealed large areas of recent demyelination, in many respects resembling the picture seen in disseminated sclerosis of man.

At the present time there appears to be no definite evidence that demyelination can be brought about by the direct action of a virus, although it is generally conceded that a virus frequently appears to initiate conditions in which demyelination is a specific factor.

Although Laidlaw & Dunkin laid well the foundations for the study of "distemper" in the field, there is a great deal more work to be done yet before we are in a position to understand and thereby deal adequately with all the problems involved under the title "distemper."

Yours faithfully,

L. P. Pugh.

Sevenoaks,
November 18th, 1947.

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WAS IT *PENICILLIUM NOTATUM*?

Sir,—Reading through the remarks of Sir Alexander Fleming made at the meeting of the Central Veterinary Society, held at the Royal Veterinary College on May 1st, 1947, my memory takes me back between 40 and 50 years when, at the same place, Professor M'Fadyean introducing his students to laboratory technique was urging upon them the necessity of covering up, as early as possible, tubes and Petri dishes inoculated with organisms one wished to incubate.

He picked up a Petri dish that had been in his incubator, removed the cover, and said: "Look at this as a warning against delay. I inoculated this medium with a loop of material containing staphylococci, but before I could place the cover over the Petri dish a spore of some kind of fungus floating about in the air alighted upon the culture medium. It will be noticed that while some of the colonies of staphylococci have grown prolifically, the growth from this spore of a parasitic fungus, apparently akin to the ordinary common mould, has also flourished, and it will be further noticed that the growth of this fungus has had a very marked deleterious action on the growth of the staphylococci, either owing to the exhalation of something, or the addition of something to the culture medium, which has been decidedly inimical to the colonies of staphylococci. In fact the growth of colonies immediately adjacent to the fungoid growth appears to have been completely inhibited. The only thing to do now is to throw the culture away."

How near was our greatest teacher to making what has since become a world famous discovery?

Yours faithfully,

Thomas Lishman.

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A LIVESTOCK IMPROVEMENT CONFERENCE

Sir,—A conference of representatives of the Landowners' Association, N.F.U., and other interested bodies was held in Exeter recently to discuss livestock improvement. Invitations to attend this conference were issued to 80 veterinary practitioners in the South-Western counties, but not one came to the meeting which was otherwise well attended. I know that practitioners are busy people, but it is regrettable that they should appear to show such a lack of interest in the activities and efforts of stock-owners to respond to the national call for increased production from the livestock industry.

Yours faithfully,

Geo. Atkinson.

Ministry of Agriculture and Fisheries,
Animal Health Division,
"Prestwood,"
Matford Avenue,
Exeter, Devon.
November 5th, 1947.

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Errata.—Mr. F. D. Asplin regrets that in Table II of his article on Newcastle Disease in Ducks and Geese (*Vet. Rec.* 59, p. 622, col. 1) the following errors were undetected in submitted proof: (1) Last column, first line, *for* "embryo" III *read* "embryo MLD"; (2) Penultimate item of Virus Dilutions, *for* 10^{-0} *read* 10^{-8}; (3) Foot-note to read: 'No. of embryos *surviving* (not "infected" as printed)/No. of embryos inoculated.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Oct. 16th to 31st, 1947	6	—	392	—	8	2
Corresponding period in—						
1946	5	1	—	—	8	1
1945	5	7	—	—	1	42
1944	5	37	—	—	91	99
Jan. 1st to Oct. 31st, '47	97	103	1,400	1	74	31
Corresponding period in—						
1946	77	34	—	7	74	332
1945	103	119	—	6	103	845
1944	154	134	—	7	177	1,200

NOTE.—**The figures for the current year are approximate only.**
*** Excluding outbreaks in Army Horses.**

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at October 31st, 1947, was as follows:—

England	Wales	Scotland	Total (Great Britain)
8,985	10,971	9,694	29,650